

New Adelaide earthquake monitoring network

David Love

Primary Industries and Resources South Australia

Project funding

This project was funded under the National Disaster Mitigation Programme. Funding of \$210,000 was received from the Commonwealth, SA Water, SA Dept Premier and Cabinet, and Primary Industries and Resources SA. The network is under construction now, and is expected to be finished by the end of the year.

Objectives

- Provide rapid epicentre and magnitude estimates
- Provide strong motion information
- Collect data for attenuation analysis
- Improve hypocentre accuracy
- Record more seismicity around Adelaide
- Provide amplification information

The network is essentially divided into two parts; the regional sites and the metropolitan sites.

The regional part consists of seven sites being established around Adelaide up to 110 km away from the city (Figure 1). These sites are installed on rock, and transmit data continuously to Adelaide via phone, wireless broadband, mobile phone or radio. Cultural noise, rock and communications are the main determinants in positioning the stations. With seven well positioned stations it is hoped to get good automatic epicentres for any events within or near the network. Five of these sites are new, with ADE (Figure 7) and SDAN being complete upgrades of sites already in use.

The metropolitan part (Figure 2) consists of three recorders which will be installed for one to two years before being moved to another site. These sites may not transmit continuously back to the central office if it is not easy to arrange communications. Security is the main determinant for these stations. It is hoped to record some events to estimate amplification effects at least in the elastic range. The equipment is enclosed in a small cabinet (Figure 6) that is connected to a large paver which is pegged to the ground (Figure 5) to stop it moving in case of a large event. The seismometer is buried alongside or underneath the paver. One site is planned for Lefevre Peninsula, to the north west of the city, which is considered to have the softest and deepest sediments of the metropolitan area, along with much important infrastructure.

The equipment being used consists of Echo recorders from Environmental Systems and Services, each with an internal accelerometer, and recording onto 1Gb Compact Flash cards. There are two Guralp 30 sec (6T) seismometers; one installed at ADE, and the other for the metro area. The remaining seismometers are Guralp 1 sec (6T-1) instruments. Communications equipment being used includes: CDMA 1x modems (which use very low power, and are only moderately expensive to run), Echo internal modems (also low power, but limited to telephone sites), standard short hop wireless radios that are popular on home ADSL connections, and RFI 9265 digital radios for ADE. Wireless broadband is proposed for the site on Yorke Peninsula. The 3G network that Telstra has just opened may improve communication options.

A computer has been set up at the PIRSA / DWLBC office at Glenside. Data from the various sites will be received here. The ADE site will transmit directly by radio to Glenside. The analogue UTT site also transmits to Glenside where it is digitised. A spare equipment set will be installed in a small courtyard in the building. This will ensure that when there is a broadband or internet disruption, data from three stations should still be

available. The office is a single storey building of reasonably modern construction, a few kilometres from the city.

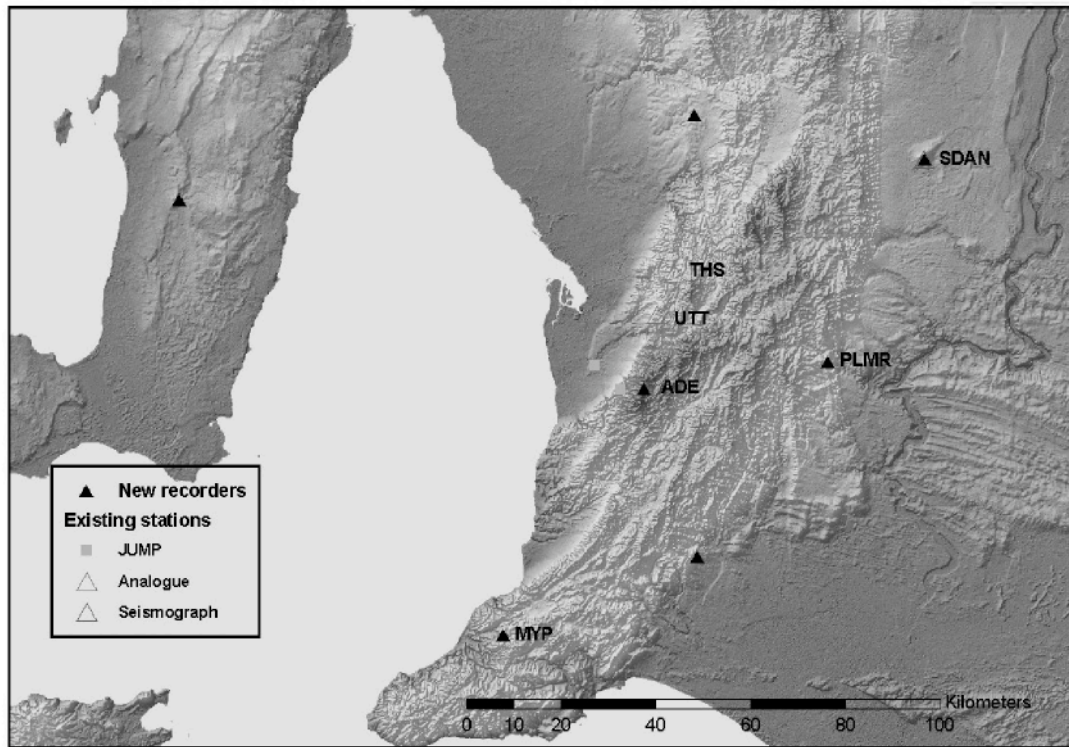


Figure 1 Regional network

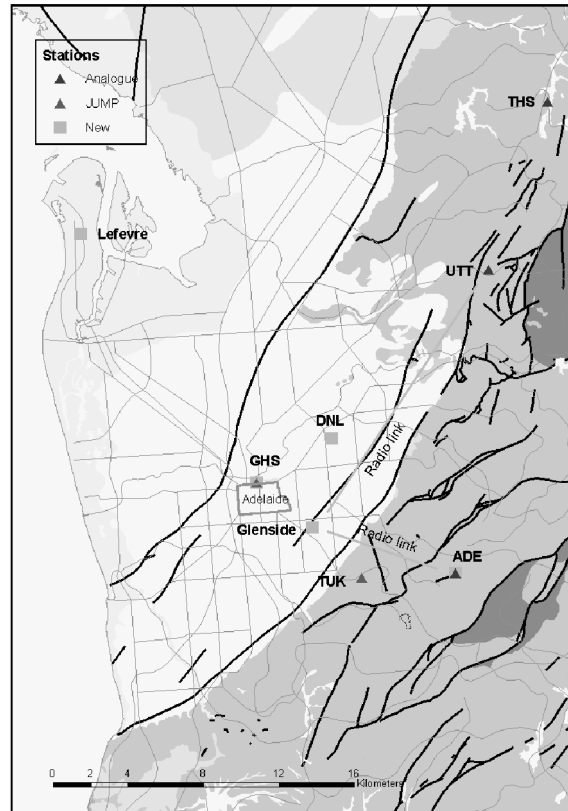


Figure 2 Metropolitan area in detail



Figure 3 Site PLMR



Figure 4 Site MYP



Figure 5 Metropolitan site

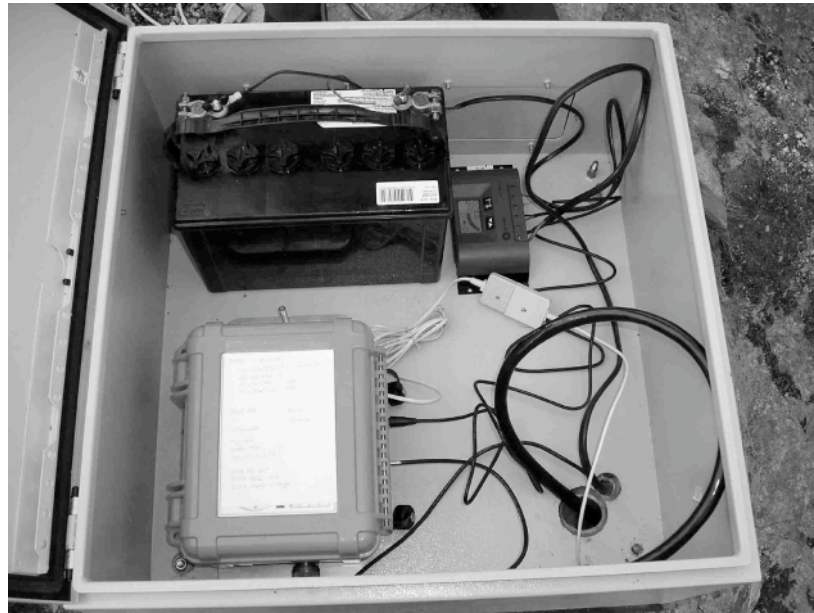


Figure 6 Equipment cabinet



Figure 7 Site ADE